WHAT IS CLAIMED IS:

1. A direct peer-to-peer transmission protocol between two virtual networks, including the following procedures:

5   (A) the login procedure, wherein a user in the virtual IP is keeping a connection with the location server of the real IP;

(B) the testing Network Address Translation (NAT) procedure, which includes the following sub-procedures:

(B1) the calling end of the first virtual IP obtains the source port

10   information of the first NAT-based router through the location server, and the same information will be transmitted to the called end of the second virtual IP through the same location server; and

(B2) the called end of the second virtual IP receives the source port information from the calling end and then obtains the source

15   port information of the second NAT-based router through the location server, and the same information will be transmitted back to the calling end of the first virtual IP through the same location server;

and

20   (C) the direct data transmission procedure, which is located in the NAT-based router that allows data packet to be mutually transmitted between the first virtual IP and the second virtual IP, including the following two situations:

(C1) if the first virtual IP sends out the data packet first, then the

second NAT-based router will discard the data packet, and, meanwhile, the transmission path for the first NAT-based router will be open, allowing the data packet transmitted by the second virtual IP subsequently to go through and complete the direct data transmission procedure; and

(C2) if the second virtual IP sends out the data packet first, then the first NAT-based router will discard the data packet, and, meanwhile, the transmission path for the second NAT-based router will be open, allowing the data packet transmitted by the first virtual IP subsequently to go through and complete the direct data transmission procedure.

2. The direct peer-to-peer transmission protocol between two virtual networks as claimed in claim 1, wherein the user in the virtual IP is using the Transmission Control Protocol (TCP) for keeping the connection with the location server.

3. The direct peer-to-peer transmission protocol between two virtual networks as claimed in claim 1, wherein the user in the virtual IP is using the User Datagram Protocol (UDP) for keeping the connection with the location server.

4. The direct peer-to-peer transmission protocol between two virtual networks as claimed in claim 1, wherein the data packet is selected from either the TCP data packet or the UDP data packet.

5. The direct peer-to-peer transmission protocol between two virtual networks as claimed in claim 1, wherein the procedure (B1) further

includes the following steps:

the first virtual IP sends out a testing packet to the location server;

the location server returns the first source port information of the testing packet to the first virtual IP;

the first virtual IP sends out another testing packet to the location server;

the location server again returns the second source port information of the testing packet to the first virtual IP;

the first virtual IP totals up the second source port information and the difference of the information for obtaining the destination port information and then transmits the destination port information to the location server; and

the location server transmits the destination port information for the first NAT-based router to the second virtual IP.

6. The direct peer-to-peer transmission protocol between two virtual networks as claimed in claim 5, wherein the difference is an absolute difference between the first source port information and the second source port information.

7. The direct peer-to-peer transmission protocol between two virtual networks as claimed in claim 1, wherein the procedure (B2) further includes the following steps:

the second virtual IP sends out a testing packet to the location server;

the location server returns the third source port information of the testing packet to the second virtual IP;

the second virtual IP sends out another testing packet to the location server;

the location server again returns the fourth source port information of the testing packet to the second virtual IP;

the second virtual IP totals up the fourth source port information and the difference of the information for obtaining the destination port information and then transmits the destination port information to the location server; and

the location server transmits the destination port information for the second NAT-based router to the first virtual IP.

8. The direct peer-to-peer transmission protocol between two virtual networks as claimed in claim 7, wherein the difference is an absolute difference between the third source port information and the fourth source port information.

9. The direct peer-to-peer transmission protocol between two virtual networks as claimed in claim 1, wherein the procedure (B1) further includes the following steps:

the first virtual IP sends out a testing packet to the location server;

the location server returns the source port information of the testing packet to the first virtual IP;

the first virtual IP totals up the source port information and a

preset difference for obtaining destination port information and then transmits the destination port information to the location server; and

the location server transmits the destination port information for the first NAT-based router to the second virtual IP.

10. The direct peer-to-peer transmission protocol between two virtual networks as claimed in claim 9, wherein the value of the preset difference is 1.

11. The direct peer-to-peer transmission protocol between two virtual networks as claimed in claim 1, wherein the procedure (B2) further includes the following steps:

the second virtual IP sends out a testing packet to the location server;

the location server returns the source port information of the testing packet to the second virtual IP;

the second virtual IP totals up the source port information and the preset difference of the information for obtaining the destination port information and then transmits the destination port information to the location server; and

the location server transmits the destination port information for the second NAT-based router to the first virtual IP.

12. The direct peer-to-peer transmission protocol between two virtual networks as claimed in claim 11, wherein the value of the preset difference is 1.

13. The direct peer-to-peer transmission protocol between two virtual networks as claimed in claim 1, wherein in the procedure (C1), the first virtual IP can send out a plurality of different port data packets in a consecutive manner to the second NAT-based router, and the second virtual IP can also send out a plurality of different port data packets in a consecutive manner to the first NAT-based router.

14. The direct peer-to-peer transmission protocol between two virtual networks as claimed in claim 13, wherein among the port data packets sent out by the first virtual IP, only one of the data packets can be successfully delivered to the second NAT-based router, whereas among the port data packets sent out by the second virtual IP, only one of the data packets can be successfully delivered to the first NAT-based router.

15. The direct peer-to-peer transmission protocol between two virtual networks as claimed in claim 1, wherein in the procedure (C2), the second virtual IP can send out a plurality of different port data packets in a consecutive manner to the first NAT-based router, and the fisrt virtual IP can also send out a plurality of different port data packets in a consecutive manner to the second NAT-based router.

16. The direct peer-to-peer transmission protocol between two virtual networks as claimed in claim 15, wherein among the port data packets sent out by the second virtual IP, only one of the data packets can be successfully delivered to the first NAT-based router, whereas among the port data packets sent out by the first virtual IP, only one of the data packets can be successfully delivered to the second NAT-based router.

17. A direct peer-to-peer transmission protocol between two virtual networks, including the following procedures:

(A) the login procedure, wherein the user in the virtual IP is keeping a connection with the location server of the real IP;

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(B) the testing Network Address Translation (NAT) procedure, which includes the following sub-procedures:

(B1) the calling end of the first virtual IP obtains the source port information of the first NAT-based router through the first location server;

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(B2) the first virtual IP transmits the source port information of the first NAT-based router to the second location server through the first location server;

(B3) the called end of the second virtual IP receives the source port information from the calling end through the second location

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server and then obtains the source port information of the second NAT-based router through the second location server; and

(B4) the second virtual IP utilizing the second location server for transmitting the source port information of the second NAT-based router back to the first location server, and then the information

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will be transmitted to the calling end of the first virtual IP; and

(C) the direct data transmission procedure, which is located in the NAT-based router that allows data packet to be mutually transmitted between the first virtual IP and the second virtual IP,

including the following two situations:

(C1) if the first virtual IP sends out the data packet first, then the second NAT-based router will discard the data packet, and, meanwhile, the transmission path for the first NAT-based router will be open, allowing the data packet transmitted by the second virtual IP subsequently to go through and complete the direct data transmission procedure; and

(C2) if the second virtual IP sends out the data packet first, then the first NAT-based router will discard the data packet, and, meanwhile, the transmission path for the second NAT-based router will be open, allowing the data packet transmitted by the first virtual IP subsequently to go through and complete the direct data transmission procedure.

18. The direct peer-to-peer transmission protocol between two virtual networks as claimed in claim 17, wherein the user in the virtual IP is using the Transmission Control Protocol (TCP) for keeping the connection with the location server.

19. The direct peer-to-peer transmission protocol between two virtual networks as claimed in claim 17, wherein the user in the virtual IP is using the User Datagram Protocol (UDP) for keeping the connection with the location server.

20. The direct peer-to-peer transmission protocol between two virtual networks as claimed in claim 17, wherein the data packet is selected from either the TCP data packet or the UDP data packet.

21. The direct peer-to-peer transmission protocol between two virtual networks as claimed in claim 17, wherein the procedure (B1) further includes the following steps:

the first virtual IP sends out a testing packet to the first location server;

the first location server returns the first source port information of the testing packet to the first virtual IP;

the first virtual IP sends out another testing packet to the first location server;

the first location server again returns the second source port information of the testing packet to the first virtual IP;

the first virtual IP totals up the second source port information and the difference of the information for obtaining the destination port information and then transmits the destination port information to the first location server; and

the first location server transmits the destination port information for the first NAT-based router to the second location server.

22. The direct peer-to-peer transmission protocol between two virtual networks as claimed in claim 21, wherein the difference is an absolute difference between the first source port information and the second source port information.

23. The direct peer-to-peer transmission protocol between two virtual networks as claimed in claim 17, wherein the procedure (B3) further includes the following steps:

a) the second virtual IP sends out a testing packet to the second location server;

b) the second location server returns the third source port information of the testing packet to the second virtual IP;

c) the second virtual IP again sends out another testing packet to the second location server;

d) the second location server again returns the fourth source port information of the testing packet to the second virtual IP;

e) the second virtual IP totals up the fourth source port information and the difference of the information for obtaining destination port information and transmits the destination port information to the second location server; and

f) the second location server transmits the destination port information for the second NAT-based router to the first location server.

24. The direct peer-to-peer transmission protocol between two virtual networks as claimed in claim 23, wherein the difference is an absolute difference between the third source port information and the fourth source port information.

25. The direct peer-to-peer transmission protocol between two virtual networks as claimed in claim 17, wherein the procedure (B1) further includes the following steps:

the first virtual IP sends out a testing packet to the first location server;

the first location server returns the source port information of the testing packet to the first virtual IP;

the first virtual IP totals up the source port information and the preset difference of the information for obtaining the destination port information and then transmits the destination port information to the first location server; and

26. The direct peer-to-peer transmission protocol between two virtual networks as claimed in claim 25, wherein the value of the preset difference is 1.

27. The direct peer-to-peer transmission protocol between two virtual networks as claimed in claim 17, wherein the procedure (B3) further includes the following steps:

the second virtual IP sends out a testing packet to the second location server;

the second location server returns the source port information of the testing packet to the second virtual IP;

the second virtual IP totals up the source port information and the preset difference of the information for obtaining the destination port information and then transmits the destination port information to the second location server; and

the second location server transmits the destination port information for the second NAT-based router to the first virtual IP.

28. The direct peer-to-peer transmission protocol between two virtual

networks as claimed in claim 27, wherein the value of the preset difference is 1.

29. The direct peer-to-peer transmission protocol between two virtual networks as claimed in claim 17, wherein in the procedure (C1), the first virtual IP can send out a plurality of different port data packets in a consecutive manner to the second NAT-based router, and the second virtual IP can also send out a plurality of different port data packets in a consecutive manner to the first NAT-based router.

30. The direct peer-to-peer transmission protocol between two virtual networks as claimed in claim 29, wherein among the port data packets sent out by the first virtual IP, only one of the data packets can be successfully delivered to the second NAT-based router, whereas among the port data packets sent out by the second virtual IP, only one of the data packets can be successfully delivered to the first NAT-based router.

31. The direct peer-to-peer transmission protocol between two virtual networks as claimed in claim 17, wherein in the procedure (C2), the second virtual IP can send out a plurality of different port data packets in a consecutive manner to the first NAT-based router, and the first virtual IP can also send out a plurality of different port data packets in a consecutive manner to the second NAT-based router.

32. The direct peer-to-peer transmission protocol between two virtual networks as claimed in claim 31, wherein among the port data packets sent out by the second virtual IP, only one of the data packets can be successfully delivered to the first NAT-based router, whereas among the

port data packets sent out by the first virtual IP, only one of the data

packets can be successfully delivered to the second NAT-based router.